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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/038,673   | 12/31/2001  | Bhashyam Ramesh      | 10238               | 9052             |
| 26890  | 7590        | 11/03/2004           | EXAMINER            |                  |
| <b>JAMES M. STOVER</b><br>NCR CORPORATION<br>1700 SOUTH PATTERSON BLVD, WHQ4<br>DAYTON, OH 45479 |             |                      |                     | BETIT, JACOB F   |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2164                |                  |

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/038,673             | RAMESH, BHASHYAM    |  |

  

|                 |                 |  |
|-----------------|-----------------|--|
| <b>Examiner</b> | <b>Art Unit</b> |  |
| Jacob F. Betit  | 21364           |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 1-47 is/are rejected.
- 7) Claim(s) \_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.



SAM RIMELL  
PRIMARY EXAMINER

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_.

## **DETAILED ACTION**

### *Claim Objections*

1. Claims 6, 19, and 32 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claims 6, 19, and 32 recite the conditional, “if the cardinality is greater than the predefined threshold value, [does] not perform[ing] a) through c)” which would omit limitations of claims 5, 18, and 31 if found to be true. “A claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in the dependent form shall be constructed to incorporate by reference all the limitations of the claim to which it refers” (see 35 U.S.C. 112 fourth paragraph). Since claims 6, 19, and 32 recite limitations that could omit recited limitations of claims 5, 18, and 31 respectively, they are not in proper dependent form.

Appropriate corrections are required.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 1-47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the hash" in line 3 and the limitation "the presence" in line

4. There is insufficient antecedent basis for these limitations in the claim.

Claims 2-4 are rejected for being dependent on rejected independent claim 1.

Claim 5 recites the limitation "the hash" in line 3 and the limitation "the presence" in line

4. There is insufficient antecedent basis for these limitations in the claim.

Claims 6-17 are rejected for being dependent on rejected independent claim 5.

Claim 6 recites the limitation "the cardinality" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 18 recites the limitation "the hash" in line 3 and the limitation "the presence" in line 5. There is insufficient antecedent basis for these limitations in the claim.

Claims 19-30 are rejected for being dependent on rejected independent claim 18.

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Claim 19 recites the limitation “the cardinality” in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 31 recites the limitation “the hash” in line 14 and the limitation “the presence” in line 15. There is insufficient antecedent basis for these limitations in the claim.

Claims 32-43 are rejected for being dependent on rejected independent claim 31.

Claim 32 recites the limitation “the cardinality” in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 44 recites the limitation “the presence” in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 45 recites the limitation “the presence” in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claims 46 and 47 are rejected for being dependent on rejected independent claim 45.

Appropriate corrections are required.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 44-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Dalal et al. (U.S. patent No. 5,594,898).

As to claim 44, Dalal et al. teaches a data structure stored in a memory for use in performing a join in a database management system executed by a computer, the data structure comprising a Star Map associated with a table referenced in a query, wherein the Star Map includes bitmap entries having locations indexed by a combination of one or more values associated with one or more join key columns of its associated table, where a bitmap entry in the Star Map, if set, indicates the presence of a row in the associated table that has entries in the one or more join key columns that, when combined, identify the location of the bitmap entry (see column 7, lines 11-60).

As to claim 45, Dalal et al. teaches a method for joining a plurality of tables T1 through TN, where each of the tables has an associated Star Map, S1 through SN, respectively, and each Star Map includes bitmap entries having locations indexed by one or more values associated with a join key column of its associated table, where a bitmap entry in a Star Map, if set, indicates the

presence of a row in its associated table that has an entry in the join key column that identifies the location of the bitmap entry (see column 7, lines 11-60), the method including:

- a) performing a Boolean operation using the bitmap entries of the Star Maps S1 through SN to produce a join Star Map SJ (see column 8, lines 7-14);
- b) using SJ to select rows from the tables T1 through TN (see column 8, lines 14-37); and
- c) joining the resulting rows to produce a join result (see column 8, lines 37-41).

As to claim 46, Dalal et al. teaches where using SJ to select rows from the tables T1 through TN includes for each set bitmap entry in SJ, searching T1 through TN for all rows having values in their respective join key columns that identify the location of the set bitmap entry (see column 7, line 63 through column 8, line 42).

***Allowable Subject Matter***

5. Claims 1-43 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

6. Claim 47 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. patent No. 5,802,521 to Ziauddin et al. for teaching determining distinct cardinality dual hash bitmaps (see abstract).

U.S. patent No. 5,864,842 to Pederson et al. for teaching optimization of SQL queries using hash star join operations (see abstract).

U.S. patent No. 5,960,428 to Lindsay et al. for teaching Star/Join queries performed using a filtered fact table (see abstract).

U.S. patent No. 6,049,804 to Burgess et al. for teaching a range index used as a high level filter to determine which indices and data segments will be used to process a query (see abstract).

U.S. patent No. 6,615,206 B1 to Jakobsson et al. for teaching eliminating database joins based on a join index (see abstract).

U.S. patent No. 6,618,729 B1 to Bhashyam et al. for teaching a star join operation using a bitmap index structure (see abstract).

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob F. Betit whose telephone number is (571) 272-4075. The examiner can normally be reached on Monday through Friday 9 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici can be reached on (571) 272-4083. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jfb  
26 Oct 2004



SAM RIMELL  
PRIMARY EXAMINER